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MAR 1992

★ DOYL/ Q15 92-184144/23 ★ CA 2036838-A
 Travel trailer with subfloor space - has main rails located inward
 from sides of travel trailer, and major components and utilities
 located in subfloor space

DOYLE R A 90.09.24 90US-587333

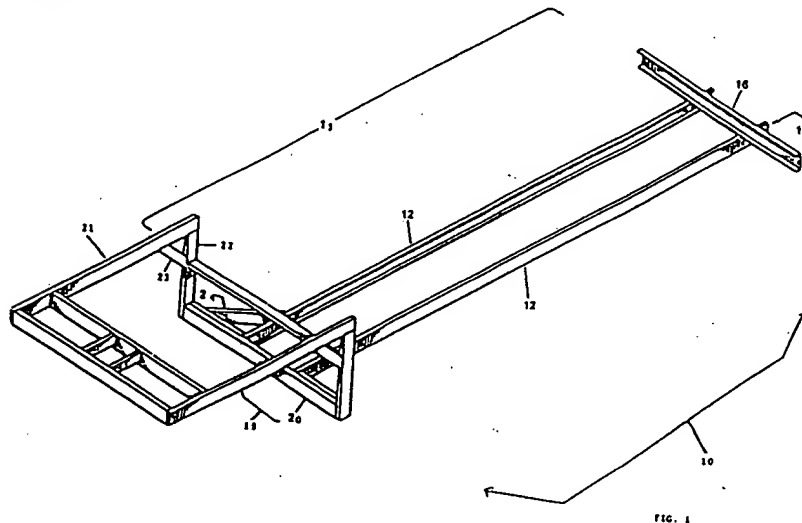
(92.03.25) B60P 3/32

91.02.21 91CA-2036838

The travel trailer has a subfloor space, which encloses the travel trailer frame, and which extends under the entire living area of the travel trailer. To enhance the utility of the subfloor space, the main rails of the travel trailer are located inward from the sides of the travel trailer.

The major components and utilities of the travel trailer can be located in the subfloor space, which not only increases the space available in the living area, but also removes restrictions from manner in which the living area can be arranged.

USE/ADVANTAGE - Increases space in the living areas and storage space. (31pp Dwg.No.1/11)
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(19) (CA) **APPLICATION FOR CANADIAN PATENT** (12)

(54) Travel Trailer

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(73) Same as inventor

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ABSTRACT

5 An improved travel trailer with increased space in the living areas and
storage space, and also with an increased number of living area configurations
is disclosed. The improved travel trailer has a subfloor space which
substantially encloses the travel trailer frame and which extends under
substantially the entire living area of the travel trailer. To enhance the utility
of the subfloor space, the main rails of the travel trailer are located inward from
10 the sides of the travel trailer. Major components and utilities of the travel
trailer can be located in the subfloor space, which not only increases the space
available in the living area, but also removes restrictions from manner in which
the living area can be configured. The improved travel trailer can be used with
a conventional travel trailer frame and also a goose-neck travel trailer frame.

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IMPROVED TRAVEL TRAILER

TECHNICAL FIELD

The present invention relates to an improved travel trailer and a method of constructing the improved travel trailer. More particularly, the present invention relates to a travel trailer with a subfloor space beneath the living area which allows major components such as air conditioners, heaters, utility lines, and water, propane and sewage tanks, to be carried beneath the main living area of the trailer, while at the same time being enclosed and accessible from the sides of the travel trailer.

15

BACKGROUND OF THE INVENTION

The general design and construction of residential trailers and recreational travel trailers has been practiced for decades and is well-known. Residential trailers or mobile homes are typically designed with living and storage areas sitting on frames which have four or more parallel, load-bearing, longitudinal beams with a plurality of transverse, load-bearing members arrayed along the length of the longitudinal beams. Examples of these typical trailer frame designs are shown in U.S. Patent No. 4,084,834, issued to Becker and U.S. Patent No. 4,863,189, issued to Lindsay. The frames taught in Becker and Lindsay have longitudinal beams on the outer sides of the frames forming a perimeter which approximates the width and length of the trailer.

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Similarly, recreational travel trailers largely have adopted mobile home designs of the type discussed above with living and storage areas sitting on a frame, although travel trailers typically use frames with only two outer longitudinal beams. The use of a mobile home frame design for travel trailers presents limitations and problems for the manufacturers of travel trailers due to

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differences between the two types of trailers in terms of their purposes and the manner in which they are used.

As the name implies, mobile homes are relatively large with a size of 70 feet by 14 feet or even larger not unusual. Mobile homes typically are transported by professional drivers using large commercial trucks, and frequently are only moved once or twice during their existence. Manufacturers of mobile homes have some flexibility in the possible configurations or layouts for the living and storage areas of mobile homes simply due to their size. Also, since mobile homes frequently are placed in a permanent location, additional storage areas outside the mobile home can be used. As a result of the above factors, structural strength is of premier importance, with weight, efficiency, and location of major components and utilities being much less important.

Travel trailers, on the other hand, are considerably smaller than mobile homes, almost always are towed by their owners with a passenger car or light truck, and typically are moved often and for great distances. Given these circumstances, owners of travel trailers must store most or all of the items they will require in the travel trailer while minimizing the intrusion into the limited living area. As a result, manufacturers of travel trailers are concerned with structural integrity of their units, but at the same time, they also must be very concerned with making travel trailers as lightweight as possible without sacrificing strength. The distribution of the weight as well as the amount of the weight must also be considered since the towability of a frequently towed travel trailer are much more important than that of the seldom moved mobile home.

Other important considerations in the design and construction of travel trailers are the efficient utilization of the limited space in the living and storage areas, and accessibility of major components which may require replenishment such as water, fuel, and sewage tanks, or repair such as air conditioners, water heaters, furnaces, and utility lines. These factors have become increasingly important over the years as travel trailers have become more expensive and more sophisticated to meet the requirements of a more demanding purchasing public. This is especially true of that growing portion of travel trailer owners who spend most or all of their time in their travel trailers. The utilization of the

fifth-wheeler or goose-neck design which allows an increase in the length of the trailer without a corresponding length increase of the tow vehicle-travel trailer combination is one attempt to expand the living area efficiently.

The mobile home frame design with the outer, longitudinal beams forces travel trailer manufacturers to make unsatisfactory choices. Components such as air conditioning units and heating units can be placed: 1) on top of the trailer, raising the center of mass and requiring a greater load bearing capacity from the trailer roof; 2) in the living area, using already limited space and limiting the different layouts possible; or 3) underneath the travel trailer, where access is difficult and the component is exposed to the elements and any objects in the road. Similar unsatisfactory choices are true for utility lines, electric, water, and sewer, and the fluid tanks used in travel trailers.

Typically, travel trailer manufacturers have adopted a combination of choices which restrict the configurations and space available in the living area. Examples are roof-mounted air conditioners, heaters installed in the living area, electrical and water lines routed through cabinets, and exposed tanks and lines underneath the travel trailer. The result is a travel trailer with vital components exposed to weather and hazards of the road, substantial restrictions on the size and configurations available for people and storage, and difficulties in routine service and repair due to limited access to the necessary components both inside and outside the travel trailer. The manufacture and assembly of travel trailers like those described above is also more difficult.

As illustrated by the above discussion, there are a number of desirable features for a recreational travel trailer. It would be desirable to have a travel trailer which maximized the number of layouts available for the living area, and further maximized the living and storage space available with a minimal increase in the overall size of the travel trailer. It also would be desirable to remove major components from the living and storage areas of the travel trailer, and from its top. Further, it would be desirable to have access to major components for service and repair from the outside of the travel trailer. Additionally, it would be desirable for major components located outside the travel trailer living area to be enclosed. It would be desirable also any improved design for a more

efficient travel trailer to adaptable to either a conventional or fifth-wheel configuration.

While the discussion herein relates to recreational travel trailers, it is not intended that the invention be limited to this situation. It will be obvious from the description that follows that the present invention will useful in other applications with problems common to those described herein.

SUMMARY OF THE INVENTION

It is the object of the present invention to provide a travel trailer which maximizes the different living area configurations available.

It is the further object of the present invention to provide a travel trailer which maximizes the space available for the living and storage areas while minimizing any increase in the overall size of the travel trailer.

It is also the object of the present invention to provide a travel trailer in which the major components can be simpler and less expensive to operate, maintain and repair.

It is yet another object of the present invention to provide a travel trailer in which most of the major components are located outside the living and storage area of the travel trailer and are enclosed.

The present invention achieves these and other objectives which will become apparent from the description that follows, by providing a travel trailer with a subfloor space that extends substantially beneath the entire travel trailer living area. The subfloor space has a subfloor created by a rectangular, planar piece of substantially rigid material which has a width and length substantially equal to the width and length of the travel trailer itself. The subfloor is the bottom of the subfloor space and is attached to the bottom of the travel trailer frame. A second rectangular, planar piece of substantially rigid material with a width and length substantially equal to the width and length of the travel trailer forms the top of the subfloor space and can also function as the floor of the travel trailer living area. The floor piece rests on top and is attached to the travel trailer frame. Thus, the travel trailer frame is substantially enclosed by the subfloor space.

In this embodiment, components which do not have to be inside the travel trailer living area are located within the subfloor space. The propane tanks, furnace, water tank, water heater, and batteries are examples of components located in the subfloor space. In addition, items such as electric and water lines and heat ducting are routed through the subfloor space and extend into the living area only where they are required to make connections for use occupants. Similarly, components such as air conditioners may be moved from roof locations to the subfloor space. Items such as circuit breakers and other components of the electrical system, and water pump and fill valve for the fresh water system are located in the subfloor space also.

The placement of the above components in the subfloor space dramatically increases both space and possible layouts available for the travel trailer living and storage areas. Also, the removal of these components from the travel trailer living area insulates the living area from the noise and heat of their operation. Service and repair of the components located in the subfloor space from outside of the travel trailer is easier and more convenient. Further, the addition of the subfloor for the subfloor space creates a thermal insulating layer which substantially reduces heat loss from the living area.

In an alternative preferred embodiment, the travel trailer creates a subfloor space as described in the above preferred embodiment using a frame with two main rails which extend substantially the length of the travel trailer and are substantially parallel to one another. The main rails in this embodiment are connected by at least two cross members. The main rails are located substantially inward from the sides of the travel trailer which allows many of the components to be located in the subfloor space and outside the main rails, thus maximizing access for service and repair.

In another alternative preferred embodiment, the subfloor space and narrow frame described in the above embodiments are used on a trailer with a goose-neck configuration. In this embodiment, there is no subfloor space or subfloor under the elevated portion of the travel trailer.

In an additional preferred embodiment, an axle subassembly is provided which in conjunction with the narrow frame described above. The axle

subassembly serves two functions. First it provides an additional frame member which increases the rigidity of the overall frame by attaching to the main rails. At the same time, the axle subassembly provides stability for the trailer axles present in the frame designs using outer longitudinal rails.

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BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a partial, front isometric view of a preferred embodiment constructed in accordance with the present invention.

Fig. 2 is a partial, front isometric view of a preferred embodiment
10 constructed in accordance with the present invention.

Fig. 3 is a partial, exploded front isometric view of a preferred embodiment constructed in accordance with the present invention.

Fig. 4 is a partial, exploded front isometric view of a preferred embodiment constructed in accordance with the present invention.

15 Fig. 5 is a side elevation view of a preferred embodiment constructed in accordance with the present invention.

Fig. 6 is another side elevation view of a preferred embodiment constructed in accordance with the present invention.

20 Fig. 7 is a partial, cross-sectional view of a preferred embodiment constructed in accordance with the present invention taken along line 7-7 in Fig's 5 and 6.

Fig. 8 is a partial, front isometric view of an alternative preferred embodiment constructed in accordance with the present invention.

25 Fig. 9 is a partial, front isometric view of an alternative preferred embodiment constructed in accordance with the present invention.

Fig. 10 is a side elevation view of an alternative preferred embodiment constructed in accordance with the present invention.

Fig. 11 is another side elevation view of an alternative preferred embodiment constructed in accordance with the present invention.

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DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

With reference to FIG.'s 1 and 2, a travel trailer frame 10 for the goose-neck configuration with inwardly set main rails 12 is shown. The main rails extend substantially the length of the travel trailer main frame or lower frame 13. The main rails also are substantially parallel to one another. Proximate the rear ends 14 of the lower frame main rails is a rear cross member 16 which connects the main rails together. Located at the front 18 of the travel trailer lower frame is a front cross member 20 which is another connection between the main rails.

The elevated or goose-neck frame 21 of the travel trailer is attached to the front of the travel trailer main frame by a pair of vertical frame members 22. The vertical frame members extend upwardly from either end of the front cross member to connect to the trailer elevated frame at 90 degree angles. The attachment between the vertical frame members and the trailer elevated frame can be strengthened by upper angled braces 23. Similarly, lower angled braces 24 can be used between the main rails and the front cross member.

The axle subassembly 25 attaches the axles 26 to the main rails and also acts as an additional cross member which connects the main rails together, as shown in FIG. 2 and in greater detail in FIG. 3. The axle subassembly has two axle support beams 28 to which the axles are attached with axle hangers 30. The axle support beams are located outward from and substantially parallel to the main rails. Attached to the axle support beams by a plurality of secondary braces 32 are at least two load transfer beams 34 that are located immediately forward and rearward of the axles. The load transfer beams are substantially perpendicular to the main rails and the axle support beams. They also are no longer than the trailer is wide. The entire axle subassembly is attached to the frame by a plurality of primary braces 36. An axle subassembly could be provided for each individual axle.

The resulting axle subassembly is a rigid frame member that strengthens the frame. At the same time, the axle subassembly with its outwardly positioned axle support beams, provides the same stability found in trailer frames using outer longitudinal main rails while allowing the use of the inwardly mounted main rails and their inherent advantages.

The lateral location of the main rails can vary considerably depending upon the size of a particular travel trailer and the needs of a particular manufacturer. A great deal success has been achieved with the main beams located so that they approximately trisect the overall width of the travel trailer with each one being located inward a distance equal to about one-third of the overall width of the trailer. The materials and methods of construction used to manufacture the travel trailer frame for this embodiment are substantially the same as those used with conventional travel trailer frames and are well known by those skilled in the art. For example, connections between frame members can be made by welding, bolting, or some combination of both.

Referring to FIG. 4, a subfloor 38 forms the bottom of the subfloor space 40 and is attached to the bottom of main rails, the front cross member, and the axle support beams. The main floor 42 rests atop and is attached to the rear cross member and the load support beams as shown in FIG.'s 4 and 7 and forms the top of the subfloor space. In this embodiment which is a goose-neck design, the top of the subfloor space is defined further by the bath floor 44 which is at an intermediate height between the travel trailer main frame and the elevated frame. Thus, the subfloor space extends substantially the length and width of the lower frame. As shown in Fig 7, the main floor section extends over the wheels 46. This fact, together with the elimination of shock absorbers by using axles with rubber ride torsion suspension 48, does away with any intrusion into living or storage areas by the wheels or suspension.

The height of the subfloor space should be tall enough to allow for wheel motion and to provide adequate area for the placement of components. Beyond these factors, the subfloor space height can vary according to the needs of the manufacturer, but good results have been obtained with heights up to approximately 15 inches. If the subfloor space height exceeds this amount by much, the center of mass and overall height of the travel trailer is raised to the point that the trailer towability is adversely effected. The increase in height of a travel trailer constructed in accordance with the present invention is compensated at least in part by the relocation of components to the subfloor space.

As illustrated in FIG.'s 4-6, this embodiment allows the travel trailer manufacturer to place components in the subfloor space that do not have to be in the living area. Many of these components can be placed in separate compartments. The propane tanks 50 have been placed in a compartment 52
5 in the subfloor at one side of the trailer. The batteries 54 also are in the subfloor space in their own compartment 56 which opens to a one side of the travel trailer. The compartments in the subfloor space can be enclosed in a variety of ways. FIG.'s 5 and 6 show doors 52a and 56a which are used to enclose the respective compartments.

10 As with the above components, the furnace 58 is located in the subfloor space and is accessible at a side of the travel trailer. The warm air is returned to the furnace through the subfloor space which heats the entire subfloor space. This heating helps to keep the components located in the subfloor space warm and also the insulating effect on the living area by the subfloor space. The
15 heating ducts 60 and 60a for the furnace are routed underneath the main floor too. This eliminates the need for placing the furnace in the living area or routing heating ducts through cabinets and closets. The circuit breaker box 62 for both the 110 volt and 12 volt electrical system can be reached easily at the side of the travel trailer, as can the cord storage box 64 in which the
20 electrical cord for outside electricity is stored. In this embodiment, the wiring 66 is routed through the subfloor space instead of the cabinets and closets in the living area. In the subfloor space, the wiring can be attached directly to the main rails which allows the wiring to be protected and reduces the need for any sort of protective covers. The only time the electrical wiring is routed into the
25 living area is to make a specific connection for a light fixture, switch, or other electrical outlet. Further, with the routing configurations discussed above, the only electrical connections or splices in the wiring can be located either in the living area at the device requiring the electrical outlet or outside the trailer at the circuit breaker box. Thus, the need for splices or connections in electrical
30 wiring in the subfloor space under the travel trailer living area can be eliminated. This vastly simplifies maintenance procedures for travel trailers

since the connections or splices are the most likely area of the electrical system to need repair.

Similar routing configurations for water lines and other facilities, which eliminates connection or junctions in hard-to-reach areas, can be used. For
5 example, the fresh water system is installed in the same manner with the active components, the pump 68, the fill valve 70, and the distribution manifolds 72, located and accessible in the subfloor space. As with other systems, water pipes 74 are routed through the subfloor space, emerging in the living area only as needed. T-junctions and other plumbing connections are located proximate the
10 water outlets whenever possible to reduce need for repairs at relatively inaccessible locations. A number of advantages are realized when a travel trailer is constructed in accordance with this embodiment. First, physical intrusions into the limited living area by needed components virtually are eliminated. This greatly reduces restrictions on the possible layouts of the living
15 area. In fact, even the layout of the relocated components in the subfloor space can be changed as desired by the manufacturer. At the same time, the relocation of components to the subfloor space increases the storage area available which is important for persons who must carry all or most of their necessities with them.

20 Greater flexibility with the location and design of other components also is available. For example, waste water storage tank capacity can be increased and the tanks 76 themselves can be designed for more efficient operation. The waste water tanks are designed to extend substantially the width of the travel trailer. This allows vent pipes to be located immediately next to walls. Also,
25 the long narrow tank is easy to remove through a door in the side of the travel trailer. The size of water tank 78 can also be increased, as can the efficiency of its operation as part of the travel trailer.

The relocated components and appliances which can be serviced and repaired from the outside the trailer simplify the operation and maintenance of
30 a travel trailer. Another advantage is the increased insulation of the living area. With the introduction of the subfloor and the enclosed subfloor space, the thermal insulation of the living area is increased. Not only is thermal loss

reduced, but also heat resulting from the operation of components, such as the water heater 79, is kept out of the living area during summer months. In addition to thermal insulation, audio insulation is increased, because the noise from such things as the furnace and the water pump have been placed beneath
5 the main floor in compartments opening to the outside of the travel trailer.

Available storage space is increased so much that virtually every component, even non-critical components such as the steps 80 are enclosed within the subfloor space. The enclosing of these components results in a trailer bottom 82 that smooth except for the drainage device 84 for the waste water
10 tanks, as illustrated in FIG. 5. The travel trailer is more aerodynamic and, therefore, more efficient to operate. At the same time, these components also are protected from the weather, and wear and tear that would occur when exposed to the environment of the open road. Also, large unobstructed storage spaces, such as storage compartment 86, can be provided with the present
15 invention. As with the other compartments in the subfloor space, the storage compartment can be enclosed by door 86.

In another preferred embodiment of the present invention, the conventional configuration travel trailer is shown with the enclosed subfloor space 90 in FIG.'s 8 and 9. This embodiment also uses a frame 92 with two main
20 rails 94 located inward from the sides of the travel trailer and an axle subassembly 96. As above, the axle subassembly has axle support beams 97 connected to load transfer beams 98 by secondary braces 100 while the entire subassembly is attached to the main rails by primary braces 102. There are also a front cross member 104 and a rear cross member 106.

25 The discussion of the above embodiment applies equally to this embodiment. Specifically, as illustrated in FIG.'s 10 and 11, major components, such as propane tanks 110, waste water tanks 116, water heater 118, and batteries 124, can be stored in the subfloor space 108. Similarly, utility lines, such as the water distribution manifold 120, and other objects like the steps 112
30 can be stored in the subfloor space. The result for the conventional travel trailer is the same as for the to the goose-neck travel trailer with the attendant benefits of increased space, including more enclosed storage compartments 114,

better design flexibility, etc. In this embodiment, the subfloor space extends substantially over the entire width and length of the travel trailer itself, since there is no elevated frame portion. Also, since the components are located in the subfloor space, they are protected from the elements and the travel trailer bottom 121 is smooth except for the drainage device 122.

Regardless of the configuration used, the benefits of the present invention are undiminished. The travel trailer built using the present invention has more room, is more efficient to tow and to maintain, has a living area with better thermal and audio insulation, and can be designed in a greater variety of living area configurations than the corresponding travel trailer with a conventional frame.

INDUSTRIAL APPLICABILITY

The present invention is applicable in any situation where it is desirable to maximize areas available for living and storage in a trailer or other enclosed space where the overall size is limited. The present invention also is applicable where flexibility in the layout of living and storage areas of a trailer or other enclosed space is desirable.

In compliance with the statute, the invention has been described in language more or less specific as to structural features, it is understood, however, that the invention is not limited to the specific features shown, since the means and construction herein disclosed comprise preferred forms of putting the invention to effect. The invention, therefore, is claimed in any of its forms or modifications within the legitimate and valid scope of the claims that follow.

CLAIMS

I claim:

- 5 1. An improved travel trailer, said travel trailer comprising:
 a width;
 a length;
 a frame extending substantially said travel trailer length;
 an enclosed subfloor space, said enclosed subfloor space having a length
10 and a width substantially equal to said travel trailer length and width, said
 subfloor space supported by and substantially enclosing said frame; and
 a living area for occupation, said living area fixedly attached to and
 located substantially atop said enclosed subfloor space.
- 15 2. An improved travel trailer as claimed in claim 1, said frame
 further comprising:
 at least two main rails, said main rails being substantially parallel to one
 another and to said travel trailer length, and with a distance between said main
 rails, said distance being substantially less than said travel trailer width, and each
20 said main rail further having a front end and a rear end;
 a front cross member, said front cross member attached to said main rails
 proximate said main rail front ends;
 an axle subassembly, said assembly attached to said main rails and further
 having at least one axle; and
25 a rear cross member, said rear cross member attached to said main rails
 proximate said main rail rear ends.

3. An improved travel trailer as claimed in claim 2, said subfloor space further comprising:

5 a subfloor, said subfloor extending substantially the length and width of said subfloor space and attached to and underneath said main rails and said axle subassembly, and said subfloor further forming a bottom of said subfloor space; and a main floor, said main floor extending substantially the length and width of said subfloor space and attached to and atop said frame and said axle subassembly, and further said main floor further forming said top of said
10 subfloor space and bottom of said living area.

4. An improved travel trailer as claimed in claim 2, said axle subassembly further comprising:

15 at least two load transfer beams, said load transfer beams being substantially parallel to each other, and each said load transfer beam having a length greater than said distance between said main rails and each said load transfer beam being attached to each said main rail by a main brace in an orientation that places each said load transfer beam perpendicular to and centered across said main rails;

20 at least two axle support beams, said axle support beams being substantially parallel to each other, and each said axle support beam having two ends and being substantially shorter than said main rails, and each said axle support beam being attached to each said load transfer beam by a secondary brace in an orientation that places each said axle support beam parallel to and
25 outward from said main rails and further places each said axle support beams perpendicular to and centered under said load transfer beams; and

a plurality of axle hangers, at least one said axle hanger attaching each said axle to each said axle support beam in an orientation that places each said axle parallel to said load transfer beams and perpendicular to said main rails
30 and said axle support beams.

5. An improved travel trailer as claimed in claim 4 wherein said distance is approximately one-third said travel trailer width.

6. An improved travel trailer as claimed in claim 4, said subfloor
5 space further comprising:

a subfloor, said subfloor extending substantially the length and width of said subfloor space and attached to and underneath said main rails and said axle subassembly, and said subfloor further forming a bottom of said subfloor space; and a main floor, said main floor extending substantially the length and width
10 of said subfloor space and attached to and atop said frame and said axle subassembly, and further said main floor further forming said top of said subfloor space and bottom of said living area.

7. An improved travel trailer as claimed in claim 2 wherein one said
15 axle subassembly is provided for each said axle.

8. An improved travel trailer as claimed in claim 4 wherein one said axle subassembly is provided for each said axle.

9. An improved travel trailer as claimed in claim 2, said travel trailer
20 further comprising a plurality of compartments located within said subfloor space outward of said main rails.

10. An improved travel trailer as claimed in claim 9, wherein each
25 said compartment is enclosed.

11. An improved travel trailer, said travel trailer comprising:
a width;
a length;
30 a lower frame, said lower frame having at least two main rails, said main rails being substantially parallel to one another, and with a distance between said main rails, said distance being substantially less than said travel trailer.

width, and each said main rail further having a front end, a rear end and a length less than said travel trailer length;

a front cross member, said front cross member attached to said main rails proximate said main rail front ends;

5 at least one axle subassembly, said assembly attached to said main rails and further having at least one axle;

a rear cross member, said rear cross member attached to said main rails proximate said main rail rear ends; and

10 an elevated frame attached to said lower frame proximate said main rail front ends by at least two vertical frame members that connect said elevated frame to said front cross member so that said elevated frame is located in front of and above said lower frame;

15 an enclosed subfloor space, said enclosed subfloor space having a length and a width substantially equal to said travel trailer width and said main rail length, said subfloor space supported by and substantially enclosing said lower frame; and

a living area for occupation, said living area fixedly attached to and located substantially atop said enclosed subfloor space and said elevated frame.

20 12. An improved travel trailer as claimed in claim 11, said subfloor space further comprising:

a subfloor, said subfloor extending substantially the length and width of said subfloor space and attached to and underneath said main rails and said axle subassembly, and said subfloor further forming a bottom of said subfloor space;

25 and a main floor, said main floor extending substantially the length and width of said subfloor space and attached to and atop said frame and said axle subassembly, and further said main floor further forming said top of said subfloor space.

30 13. An improved travel trailer as claimed in claim 11, said axle subassembly further comprising:

at least two load transfer beams, said load transfer beams being substantially parallel to each other, and each said load transfer beam having a length greater than said distance between said main rails and each said load transfer beam being attached to each said main rail by a main brace in an orientation that places each said load transfer beam perpendicular to and centered across said main rails;

at least two axle support beams, said axle support beams being substantially parallel to each other, and each said axle support beam having two ends and being substantially shorter than said main rails, and each said axle support beam being attached to each said load transfer beam by a secondary brace in an orientation that places each said axle support beam parallel to and outward from said main rails and further places each said axle support beams perpendicular to and centered under said load transfer beams; and

a plurality of axle hangers, at least one said axle hanger attaching each said axle to each said axle support beam in an orientation that places each said axle parallel to said load transfer beams and perpendicular to said main rails and said axle support beams.

14. An improved travel trailer as claimed in claim 13 wherein said distance is approximately one-third said travel trailer width.

15. An improved travel trailer as claimed in claim 13, said subfloor space further comprising:

a subfloor, said subfloor extending substantially the length and width of said subfloor space and attached to and underneath said main rails and said axle subassembly, and said subfloor further forming a bottom of said subfloor space; and a main floor, said main floor extending substantially the length and width of said subfloor space and attached to and atop said frame and said axle subassembly, and further said main floor further forming said top of said subfloor space and bottom of said living area.

16. An improved travel trailer as claimed in claim 11 wherein one said axle subassembly is provided for each said axle.

17. An improved travel trailer as claimed in claim 13 wherein one said
5 axle subassembly is provided for each said axle.

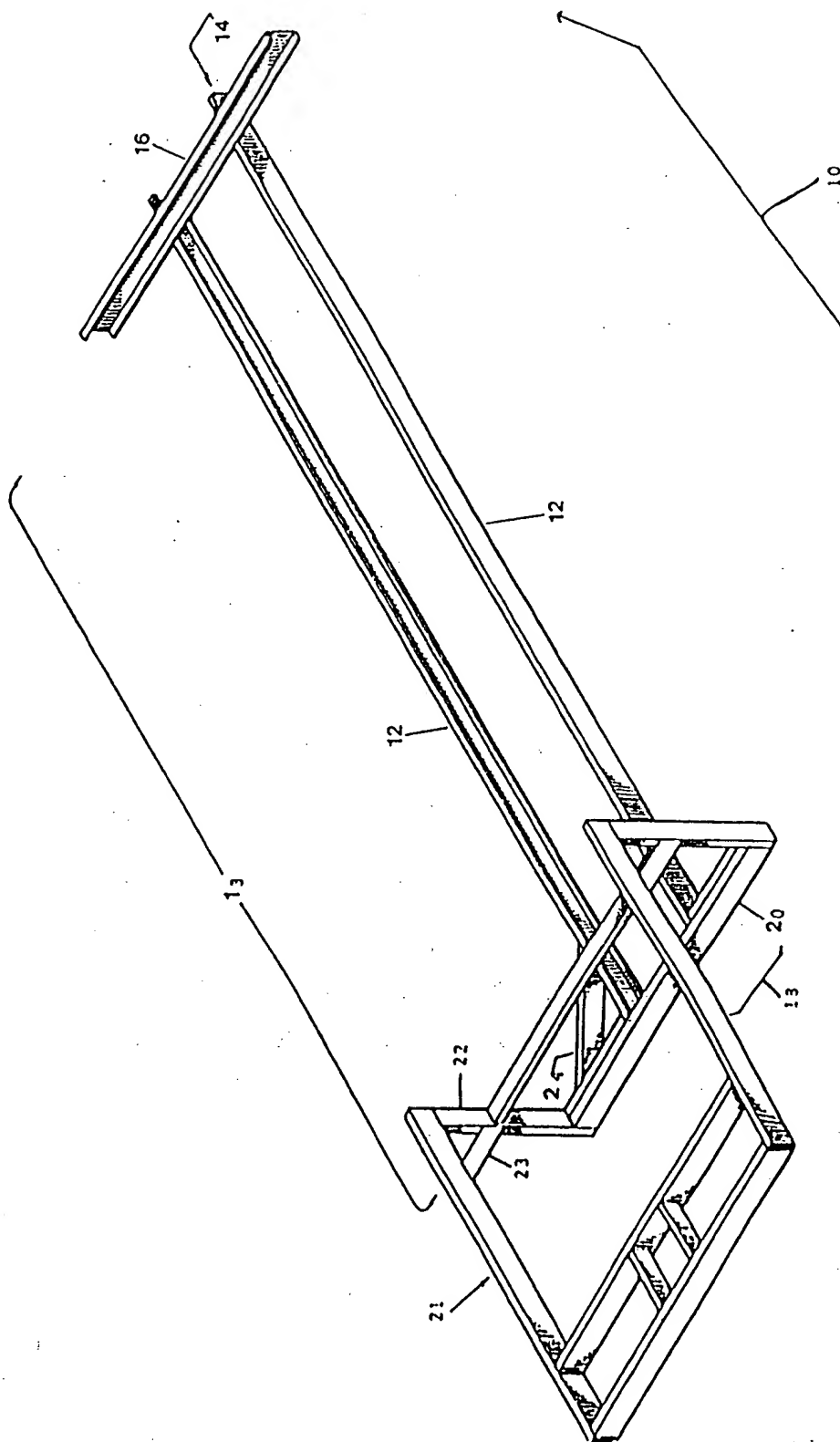
18. An improved travel trailer as claimed in claim 15, said travel trailer further comprising a plurality of compartments located within said subfloor space outward of said main rails.

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19. An improved travel trailer as claimed in claim 18, wherein each said compartment is enclosed.

20. A method for constructing an improved travel trailer, said method
15 consisting of:

- constructing a travel trailer frame with main rails;
- locating said main rails inward from a projected width of said travel trailer;
- constructing an enclosed subfloor space which substantially encloses said
20 frame; and
- constructing a living area for said travel trailer, locating said living substantially over said enclosed subfloor space.



Patented
Sept. 19, 1990

2036838

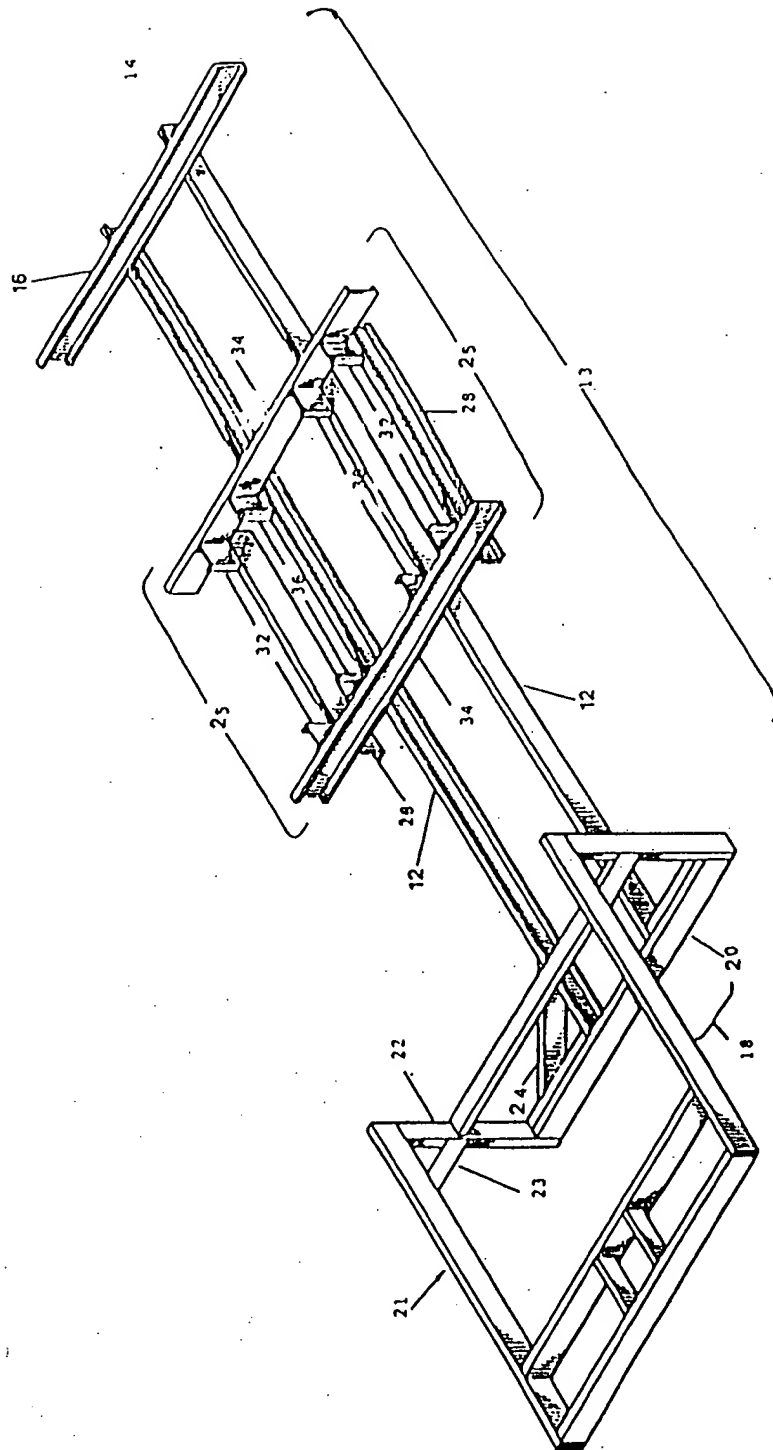


FIG. 2

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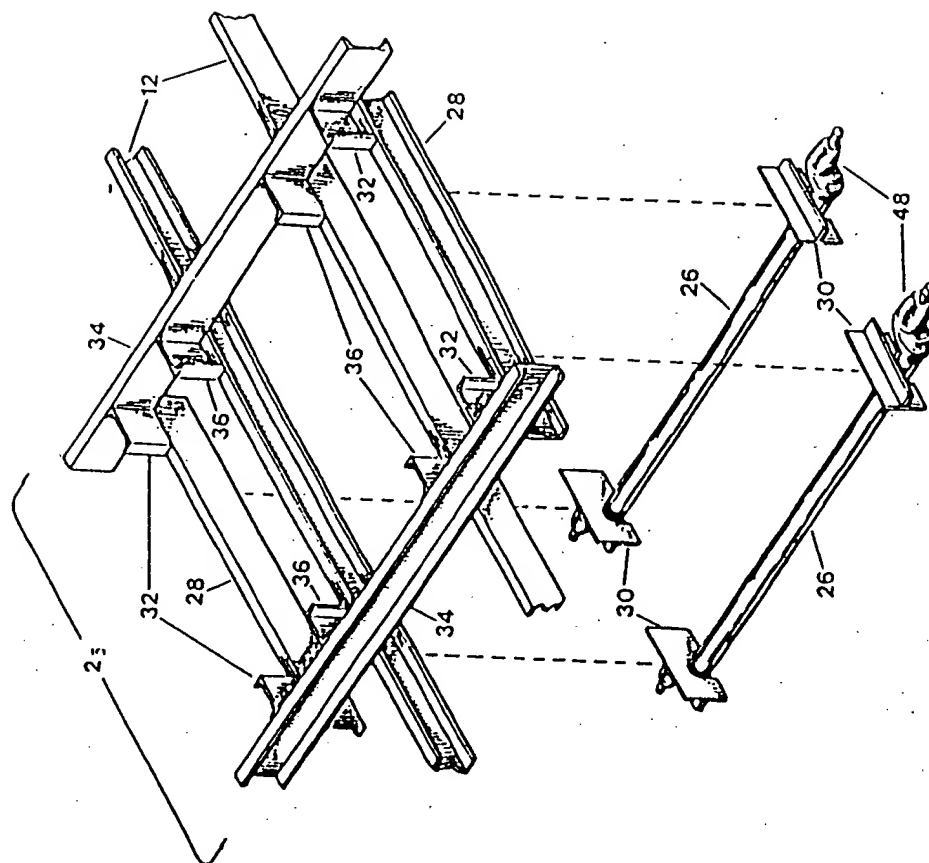


FIG. 3

Patent A

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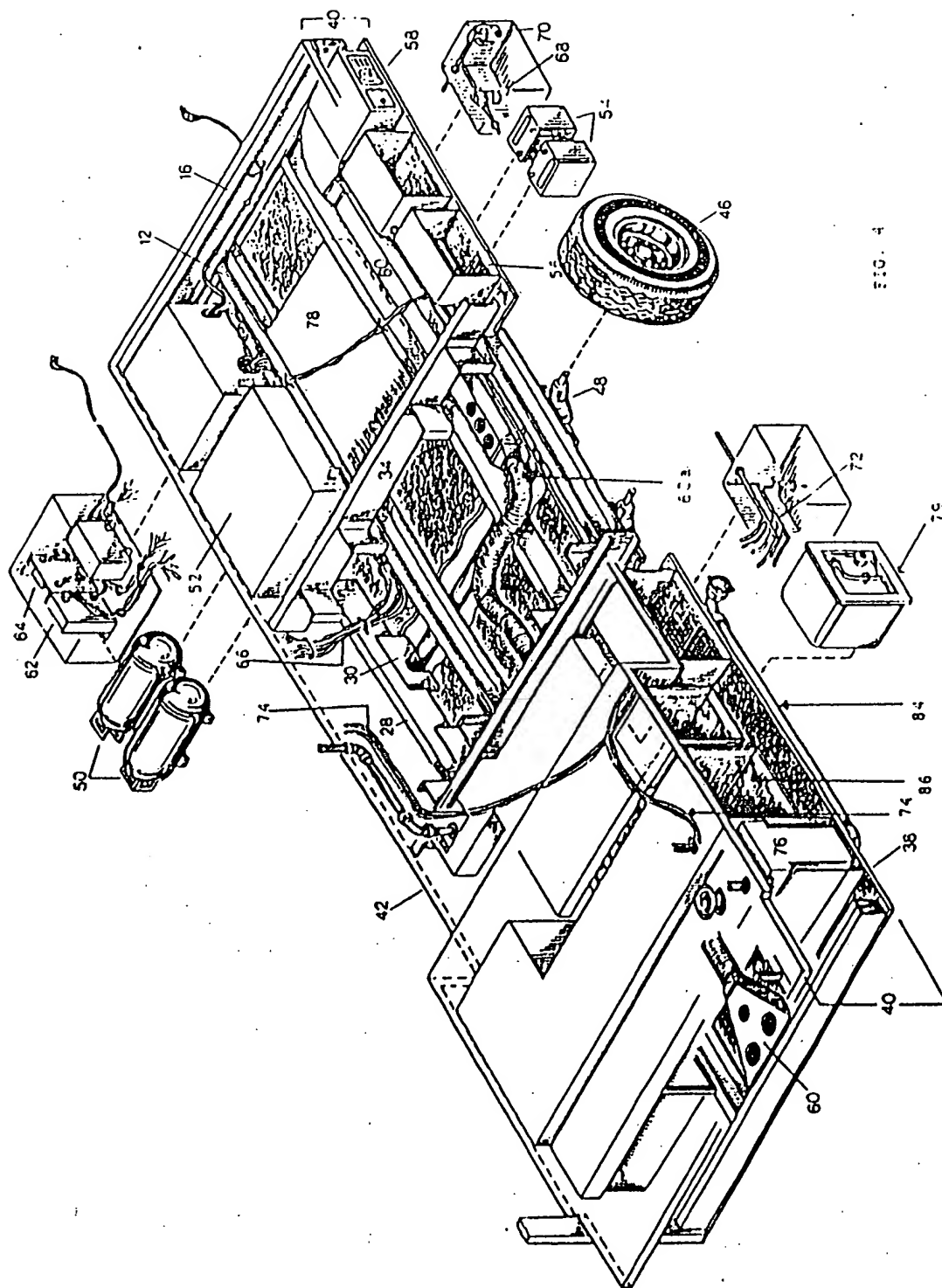
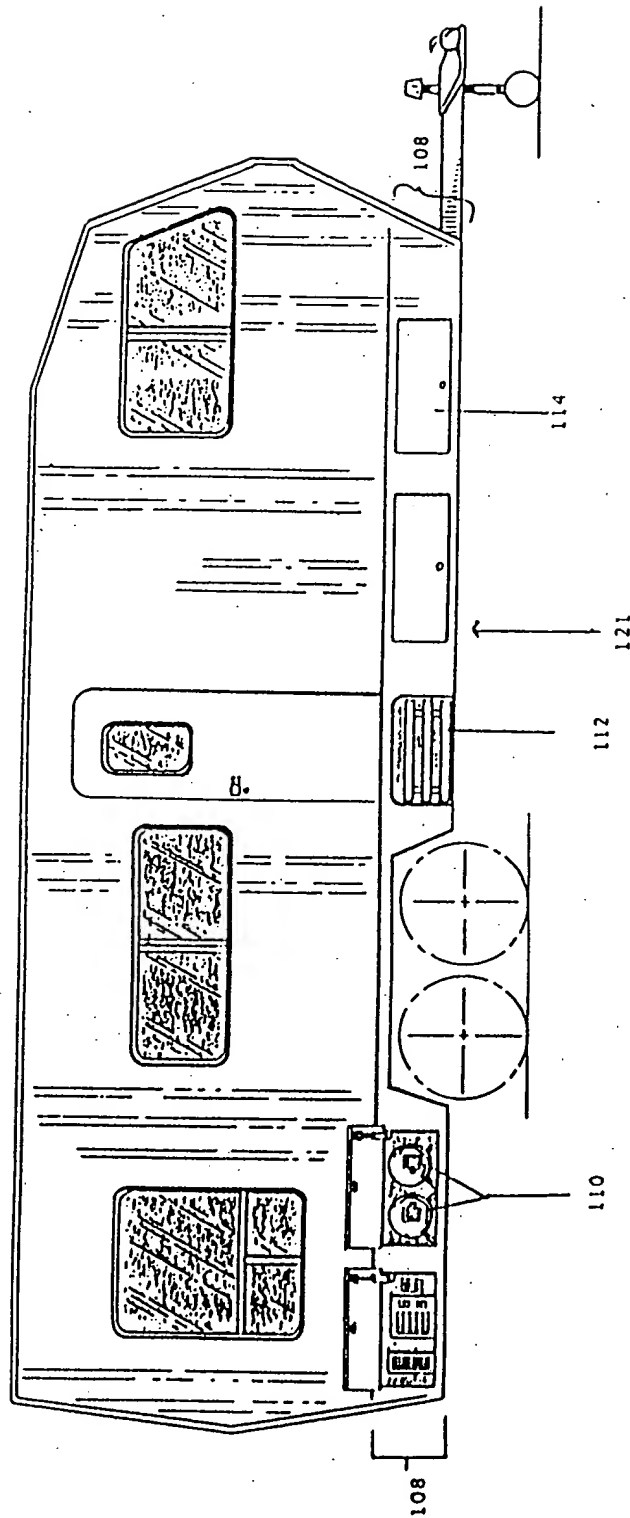
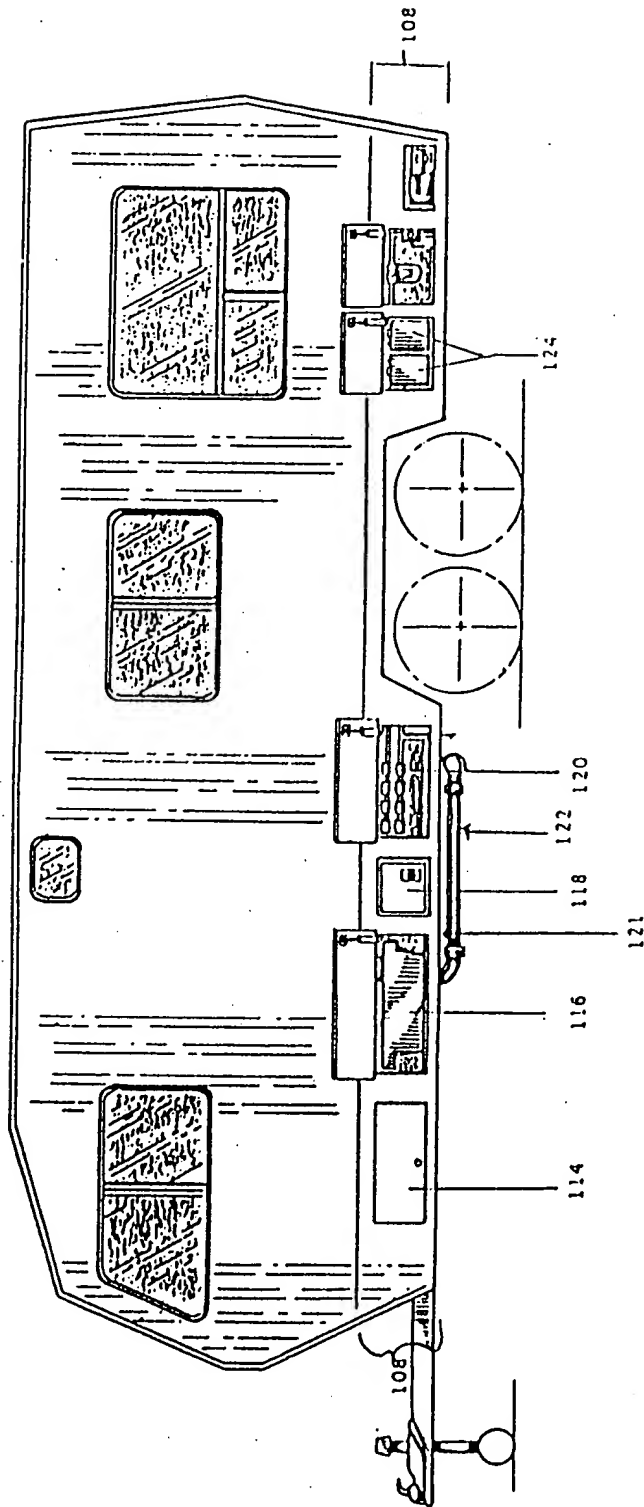


FIG. 4

Patented July 15, 1941



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Patent Agent